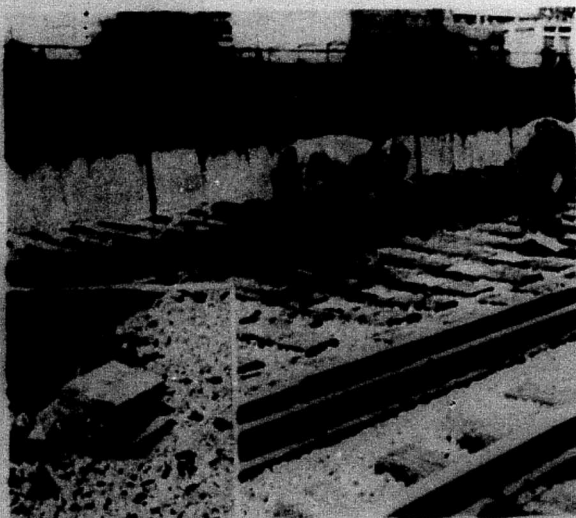




TIE PADS as installed under the newly placed tie plates prior to laying new rail on New Haven's Cape line.

Installation of Tie Pads . . .

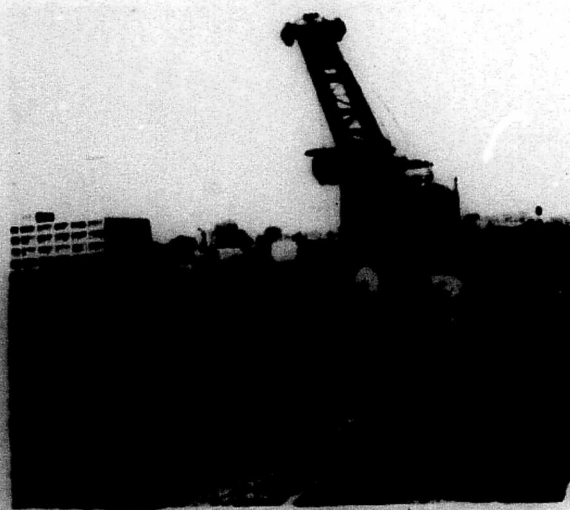


TIE PADS, which were distributed along the track in bundles (inset), being placed in position on the ties.



DUN-RITE GAGER was used to align the tie plates. Every fifth tie on tangent was secured with wood anchor plugs.

Use of Modern Machines . . .



RAIL WAS LAID with a Koehring crawler crane operated atop a Koehring railroad propulsion car.

Features of New Haven Rail Laying

The installation of tie pads coincident with the laying of new rail has been standard practice on the New York, New Haven & Hartford since 1951 when it was decided that such a policy would result in an increase in tie life of approximately 10 per cent through the reduction of deterioration and mechanical wear of ties in the plate area. How this policy in practice was integrated within a highly mechanized rail-renewal operation was recently demonstrated at a location a few miles south of Boston where some 9 miles of track on the road's Cape line were relaid with 115-lb. rail.

The basic gang organization used by the New Haven on this particular job was one which had been used, with much success and with modification, since 1950. Many of the most recent developments in the field of mechanized rail laying were employed, including the Nordberg Dun-Rite gaging machine which was reported to be instrumental in maintaining a high rate of production. Other modern machines used included two Koehring crawler cranes operated atop Koehring railroad propulsion cars for throwing out the old rail and laying the new, power wrenches, spike pullers, a ballast extruder.



POWER WRENCHES were employed to remove the old bolts. A welder torch-cuts bolts on which nuts were frozen.



BALLAST EXTRUDER was used to bring the ballast level below tops of ties at tie plate locations.

tie adzers, a tie sprayer, a pre-gaging template and pneumatic spike drivers and spot tampers supplied by on-track, self-propelled air compressors.

The gang, approximately 50 per cent from regular track forces and 50 per cent hired especially for the job, progressed at an average rate of a track-mile per day, under moderately heavy adjacent-track traffic, at an estimated cost of \$2,175 per mile. Bad ties in this territory had been renewed several months before when the ballast section had been changed from gravel to stone. All in all, 130 laborers plus 47 employees of other classes, such as foremen, assistant foremen, machine operators, welders, maintenance helpers and equipment engineers, were employed in the rail-laying operation.

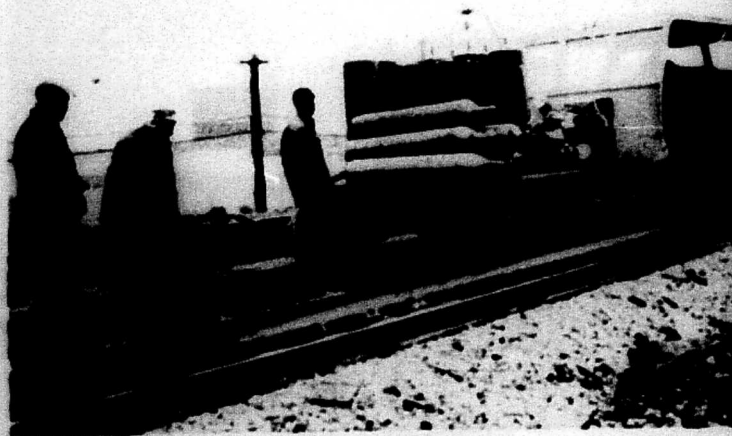
After completion of the job, the track was given a 1- to 2-in. raise with a Matisa tamper. The work was under the general supervision of W. H. Haggerty, roadmaster, W. W. Chafee, general track supervisor, and W. F. Sullivan, track supervisor at Braintree, Mass., directed the work on the ground.



PNEUMATIC SPIKE DRIVERS were supplied with air by this on-track, self-propelled compressor.

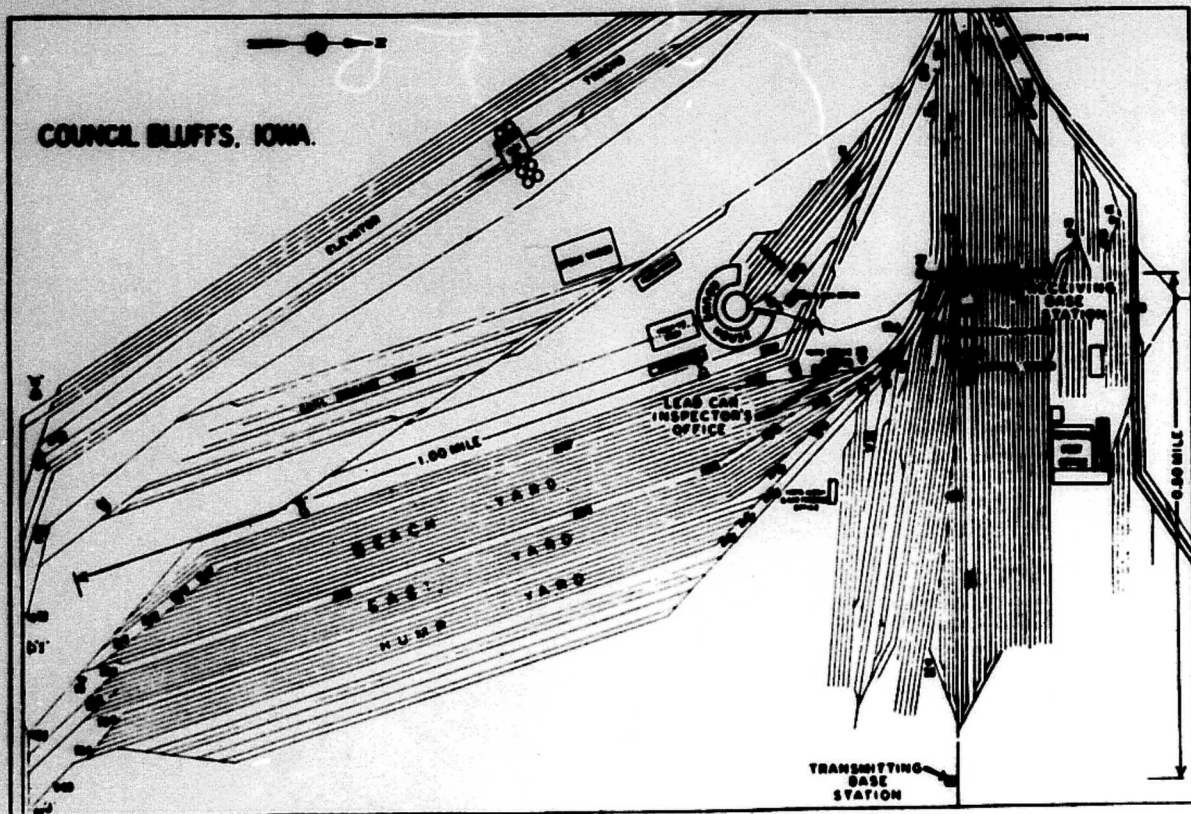
THE REASONING behind the New Haven's decision to adopt its all-out tie-pad installation program dates back to 1938 when the road first began experimenting with tie pads. Between 1938 and 1946 many different types of tie pads were tested, although it was not until the latter year that any installations were made in comparatively long stretches of track.

To date, some 147 miles of track have been laid with tie pads on the New Haven, and the road estimates that, through the exclusion by the pads of moisture, sand, ballast and other foreign material from that portion of the tie covered by the pad, it gains an increase of at least 10 years in average tie life. The cost of unloading, distributing and placing tie pads in conjunction with rail-laying operations such as the one here described has been estimated to be \$119.31 per track mile.



RAIL ENDS were heat treated by a welder using an oxy-acetylene torch and a baffle box.

How Inspectors Use Walkie-Talkies



... In This Union Pacific Yard

Reliable communications are secured by dual-frequency walkie-talkies—Calls from them are received at a fixed station (receiving only), and then transmitted at a different frequency from a second fixed station (transmitting only)

A novel system of radio communication has been installed by the Union Pacific for the use of car inspectors in a large freight yard in Council Bluffs, Iowa. In the yard areas as shown in the plan, Beach yard is the departure yard for westbound UP trains. Blocks ranging from 20 to 60 cars each are pulled from the classification yard and set out in this Beach yard. As soon as each block arrives, the car inspectors begin work to check the trucks, wheels, air brakes, brake rigging, etc. Carmen work with them to oil and pack the journals and bearings.

In this work, the inspectors at the two ends of a block or at any other locations, have numerous occasions to talk to each other or to wave hand signals to each other. This is especially true when setting up blue flags or taking them down, as well as when pumping up air and testing the air brakes. Also, when car inspectors locate defects on cars, they report to the lead car inspector or have him call the car foreman. The car department of the Union Pacific realized that much time was being lost by these inspectors when walking back and forth to talk or to signal to each other, as well as when they had to walk to the nearest telephone to call their lead inspector or foreman. The car department officers, therefore, requested the UP communication engineers to investigate the practicability of equipping the car inspectors with walkie-talkie radio sets.

Radio Field Tests Were Made

The first tests showed that due to adverse circumstances, walkie-talkies, working from one to another directly, could not maintain reliable adequate coverage. When the yard tracks were full of cars, two inspectors separated by more than 50 car lengths could not hear each other using their walkie-talkies. Similar difficulty was encountered if the men were separated by several tracks of standing cars. Also, they had difficulty in calling the lead inspector in the yard office. After making extensive studies of the special conditions involved, the communication engineers decided that the solution was to put up fixed radio stations which would pick up call

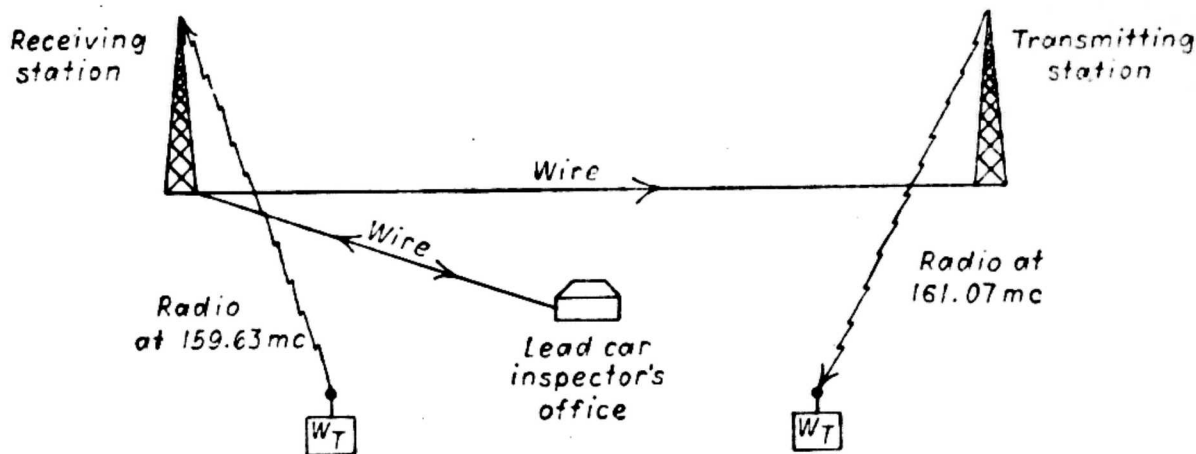


LEAD CAR INSPECTOR in the yard office receives reports from his inspectors in the yard via radio.

from the walkie-talkies and rebroadcast them with more power.

In order to be sure that the installation would result in satisfactory communication under every conceivable adverse circumstance, a decision was made to install one fixed station to receive the calls from walkie-talkies in the yard, and a second fixed station to retransmit them at a higher power. The transmitter and receiver stations were purposely located far apart (about $\frac{1}{2}$ mile) to prevent interference between the low-energy incoming signal and the higher powered outgoing signal. The antennas for these stations are on 100-ft. floodlight towers, the transmitter at the east end of the yard and the receiver at the west end. The walkie-talkies receive at 161.07 mc., and transmit at 159.63 mc. The fixed station receives at 159.63 mc., and the other fixed station transmits at 161.07 mc.

To call the lead car inspector, the inspector in the yard uses his walkie-talkie which broadcasts his voice by radio. The fixed receiving station picks up the call and



BLOCK DIAGRAM of the Union Pacific's yard radio system.

"Piggybacks"—Sound Idea Or Flash in the Pan?

Marshall Field & Co. has invested millions of dollars in building, maintaining and promoting its famous store at the corner of State and Madison streets, Chicago. With its huge investment already made at this location, this company could have no great zest for changes which might pull trade away from its downtown store. Nevertheless, competition from suburban stores and shopping centers is, apparently, forcing Field's to make such changes. Anyhow, the company is now pouring new capital into "branch" or "suburban" stores. The development of these new branch stores has been the supplier's response to fundamental changes in customers' shopping habits which have evolved in recent years.

Marshall Field & Co. seems to believe that it must get into suburban locations—even though they may temporarily pull trade away from its downtown store—if the company is to retain present business and attract additional trade. This change doesn't mean that the downtown store will be abandoned or that efforts to promote its business will terminate. On the contrary, it is believed that suburban branches may eventually even stimulate sales at the downtown store.

The experience of this merchandising company is of interest to railroaders because they are facing similar problems. Competition has brought about some basic and important changes in the habits and customs of the shipping public—as well as of department store patrons. More freight is moving by truck. New plants are locating "off rail" in increasing numbers because improved highways and good truck service make rail sidings, for some businesses, no longer absolutely necessary. Further, good industrial locations with sidings are becoming increasingly hard to find and are correspondingly more expensive.

There are other considerations, too, among them the comparative over-all costs of truck and rail service, and the frequent superiority of the trucks in speed. Industrial practices and techniques are changing, and so are shipping needs and habits. Industry is decentralizing, and has developed an increasing need for smaller-quantity, l.c.l.-type services. In sum, competitive conditions in the transportation industry are vastly changed from what they were even as recently as a dozen

years ago. Like the big department stores, the railroads are beginning to give more and more consideration to methods of doing business which will more nearly respond to present-day conditions.

The use of substituted truck service for handling l.c.l. is one technique the railroads have developed to meet the transportation needs of today; but other devices are available and are needed. Faster service—particularly for the smaller shipments — and competitive rates which make full use of the railroads' cost advantages are among the objectives toward which the industry is moving.

The handling of loaded trailers on flat cars—variously known as "piggybacks" or T-O-F-C—is another method for meeting some of today's problems. Few developments in the railroad industry have received the thought and attention which have been devoted to this subject in recent months. This interest has arisen, not only in the railroad and trucking industries, but among shippers and receivers of freight, and public authorities who are concerned with the effectiveness of the nation's transportation system. The potential development of this service presents problems which are big and complex, but they are intrinsically no more difficult of solution than the problems facing such big-city department stores as Marshall Field & Co.

Whose Trailers Should Railroads Haul?

There are two ways in which trailers-on-flats can be employed: One is through the use of highway trailers as an improved means for the handling of rail-billed traffic. The other is for the railroad to handle trailers belonging to motor common carriers. Each type of movement has something to be said both for and against it — and neither could operate successfully without a great deal of skill and ingenuity.

The more controversial of the two proposals is that involving handling by the railroads of trailers belonging to competitive motor common carriers. Before there is any serious effort in the direction of providing this kind of service, it would appear that the railroads should make every effort to attract all the traffic they can into railroad cars in all-rail service. But the movement of highway common carrier trailers by rail should certainly not be omitted from consideration, if such service can be shown to operate to the benefit of common carriers by rail and highway, and their patrons.

If railroads are going to get into the T-O-F-C

service as agents for common carrier truckers, it will have to be recognized that, in any event, such service cannot be operated everywhere by every railroad. If such service is to be a financial success for the railroads it will have to be limited to areas where potential volume is large enough to justify the provision of special trains on expedited schedules. Experience strongly suggests that this is not a kind of traffic which can be handled successfully in existing freight trains—except in those rare instances where there are trains with schedules and performance records suitable to the needs of the motor common carrier industry. By dividing the traffic among competing railroads—if indeed, such a thing could be accomplished—the economic advantages of the service to each railroad would be materially lessened.

If "piggyback" service is going to be offered for motor common carriers, then two important ends should be sought: (1) Bringing in revenues to the railroads in a traffic form which can be handled selectively and profitably, but avoiding loss or diversion of existing railroad traffic and revenues; (2) an affirmative and significant effort toward private settlement of the long-standing, debilitating controversy between the railroad and trucking industries which is injurious to both branches of the transportation industry. Other aspects of this proposal will be discussed in this space in subsequent issues.

C. L. Dearing on the Common Carriers' Situation

It has been many a long year since an expression on transportation from the executive branch of the federal government has evidenced such understanding of the subject as did the speech of Charles L. Dearing, deputy undersecretary of commerce, at the recent meeting of the American Economic Association (*Railway Age*, January 11, page 13). No one, outside or inside the transportation industry, has heretofore given evidence of such full appreciation as Mr. Dearing has of the threat to the common carriers in (1) continued rigid regulation of them, combined with (2) a large and continually growing supply of "exempt" carriers.

Continuation of this condition, Mr. Dearing foresees, threatens "to leave the common carriers only the marginal traffic between the main traffic centers," while they continue to maintain "high-cost service between points offering only limited

or unbalanced traffic." What this means, of course, is that the present regulatory pattern is tending to deprive the common carriers of the mass traffic movement to which they are naturally fitted, and to keep them forcibly in the retail business where they are probably economically inferior to other agencies. Mr. Dearing further observes that government aid to various forms of transportation has been extended without regard to the effect of the impact of such expenditures on the welfare of "the essential common carrier."

Price Should Reflect Advantages

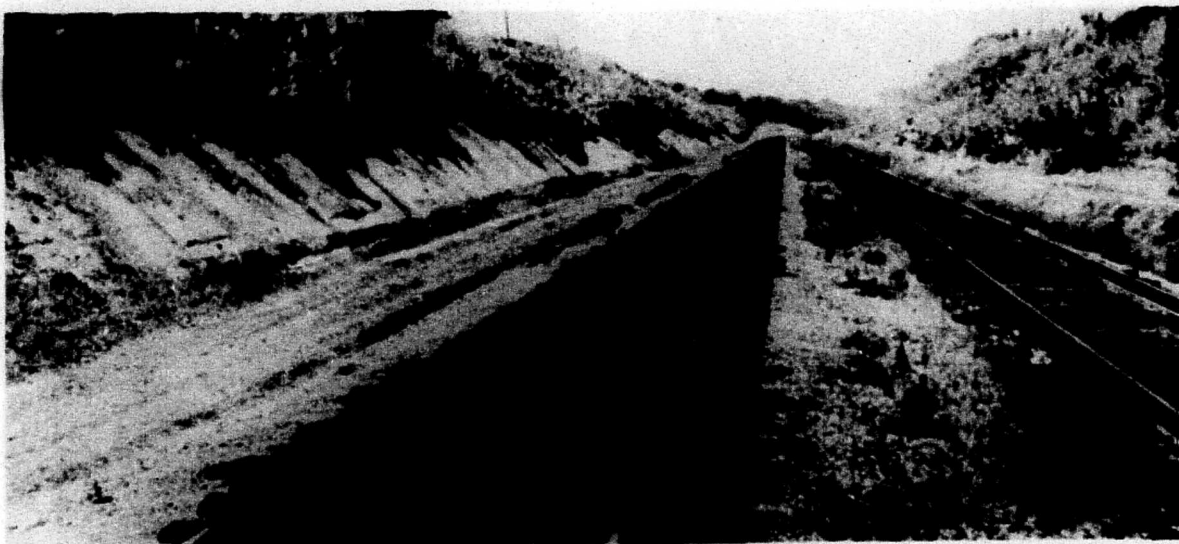
Mr. Dearing believes that common carriers should be relieved of the obligation to provide service that can be provided more economically by private transportation, or by for-hire carriers who are not in the "common carrier" classification. Moreover, he has no enthusiasm for Interstate Commerce Commission authority to inquire into the probable effect of rates on the movement of traffic; and he definitely favors the right of transportation agencies to reflect their "inherent advantages" in their price structures, in order to make a bid for all traffic which they can handle economically.

He goes on to observe that there have been many "full-scale investigations covering practically all major aspects of federal policy in the transportation field," and that "official awareness" of the problem "is present in full measure but corrective action has lagged."

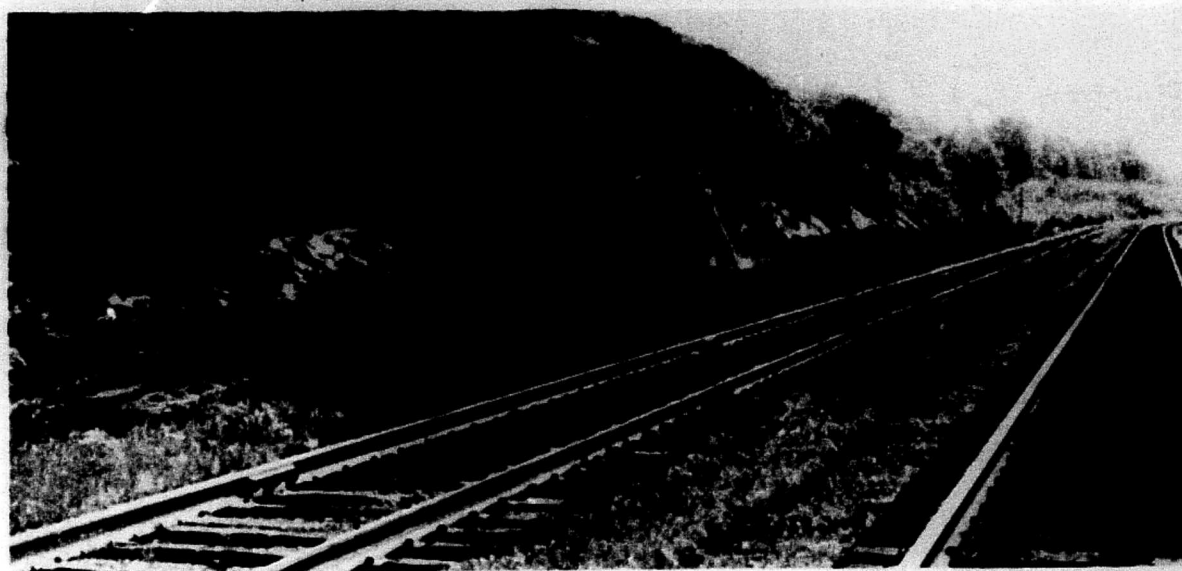
Why has there been so much thinking, so much discussion, and so little action? Mr. Dearing answers that question by observing that major changes in adapting national legislation to transportation developments "occur only when strong transportation statesmanship is asserted or when the general circumstances are such as to solidify and make articulate the demand for correction in the public interest."

In other words (if we understand the statement correctly)—there will be appropriate legislative changes affecting transportation whenever the people in and around the industry develop the required degree of statesmanship to induce Congress to act; or when transportation conditions deteriorate to the extent necessary to awaken the general public to the necessity for taking remedial action.

In the higher echelons of the Eisenhower Administration there has been, as yet, no public utterance of the kind of sound sense which Mr. Dearing has evidenced. Instead, at the higher levels, all the interest so far shown in transportation has been directed toward making conditions tougher, not easier, for the common carriers (e.g., the St. Lawrence Seaway).



Roadway Restoration . . .



How the Santa Fe Does It

Road organizes grading outfits with large earthmoving machines to restore eroded cuts and fills to standard cross section

The slow attrition through erosion of its embankment shoulders and slopes and the filling up of its cut ditches impelled the Santa Fe to take remedial action. Three years ago the road organized a small right-of-way grading outfit on its Eastern lines, equipped it with modern earthmoving equipment, and began to restore its railroad to

standard cross section. Performance of the outfit was so satisfactory that the road organized a similar outfit on its Western lines in 1953, and plans have been projected to equip the Coast lines and Gulf lines with comparable outfits.

In assembling the initial outfit in 1951, the road first



1. **THE ADVANCE UNIT**, an International TD 18A tractor-bulldozer, cut a path along the side ditches.



2. **CATERPILLAR** grader made first pass and bladed material into a windrow to be picked up by . . .

acquired a LeTourneau E-9 Tournapull Roadster. Later the same year it added a Caterpillar D4 crawler tractor equipped with a bulldozer blade and a No. 40 scraper, and an International TD 18A tractor bulldozer. It was found expedient to rent a motor grader to work with these units, but in 1953 the road purchased a Caterpillar No. 12 motor grader and made it a permanent part of the grading outfit.

All Units Diesel Powered

All these machines in the initial outfit can travel under their own power along the highways, with the exception of the tractor and scraper which must be carried on a flat car for long hauls, but travel under the tractor's power along the right of way to the work site. All the units are diesel powered so that only one type of fuel need be furnished, this being shipped in a tank car from which it is drawn into barrels and hauled out to the machines.

The units are serviced by a Ford $\frac{3}{4}$ -ton pick-up truck, which also is used for exploring the best routes for the machines to travel in reaching work sites from the highways, as well as for carrying the machine operators back and forth from town. Air for tires is provided from the air-brake system of the Tournapull. For this purpose the brake system is provided with a tee and cut-off valve.

Work Is Programmed

The working force of the outfit on the Eastern lines consists of four machine operators and two local section laborers, under the supervision of an assistant roadmaster. The work schedule is programmed on an annual basis with the men employed all year. The annual work program is prepared by the district engineers and is submitted to the general manager of the particular grand division for approval.

When preparing the program, consideration is given to climatic conditions, i.e., the program may have the outfit working in Oklahoma during the winter months, and in the more northerly territories during the summer. Consideration is also given to the locations where rail

is to be relaid during the current year so that the cut-and-fill restoration work will be completed in advance of the track work. In addition to cut cleaning and fill restoration, the program also includes such work as cleaning ditches which skirt yards, outlets from bridges and other drainage openings.

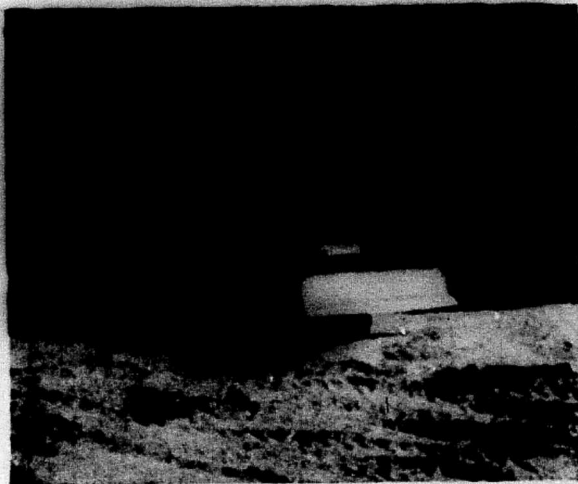
After the maintenance grading program has been approved, the cuts and fills are cross-sectioned by the local division engineer's forces so the yardage moved and the unit costs can be ascertained. One of the biggest problems has been disposition of the excavated material as usually the yardage removed by cut cleaning far exceeds that which can be used for restoring embankment shoulders to the standard roadbed section. Some of this excess material was used to advantage near the ends of the cuts in making "turn-around" areas for the earthmoving equipment, which required a circular area from 18 to 20 ft. in diameter. However, much of it was wasted along the toes of the embankments.

Work Done Out-Of-Face

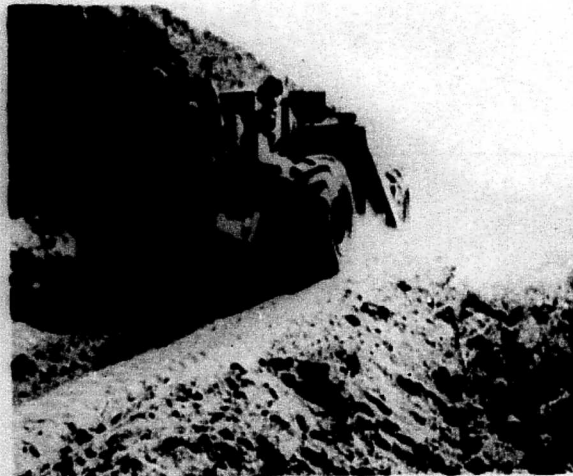
After the cross-sectioning surveys have been made, the grading outfit moves in and, in general, carries out its work on an out-of-face basis. One of the laborers assigned to this outfit removes the roadway signs and places them out of the way of the work in a place where they can be recovered and re-erected later. When cleaning the cuts the objective is to remove the accumulated material from the side ditches until the bottoms are about 3.5 ft. below the top of rail. The excavated material is deposited along the sides of the embankments until they are restored to their original cross section.

One of the bulldozers works in advance making side-hill cuts in two or three cuts so that the heavier units can work without difficulty. The motor grader is used to shape the cut slopes and also makes the final shaping of the fills. The roadway signs are re-erected by the second laborer, and both serve as flagmen as needed.

In general, the work is started at 7:30 a.m. and continued until 3:30 p.m., except for a half hour for lunch. The four machine operators and the assistant roadmaster are each housed in a separate bunk car and have their



3. A NO. 40 SCRAPER, towed by a Caterpillar D4 tractor-bulldozer. The following unit was a . . .



4. TOURNAPULL ROADSTER which hauled the excess material from the cut, taking 6 cu. yd. each trip.



5. CUT SLOPES were restored to original excavation line by motor grader with blade in sidehill position.



6. CLEANED CUT is now ready for the fall and spring rains. Note "turn-around" area in foreground.

families with them. The cars are equipped with electric lights, water, refrigerators, and fuel for both heating and cooking purposes. The assistant roadmaster makes weekly reports showing where the outfit has worked, the number of hours worked by each machine and also the hours, if any, that a machine is out of service for repairs.

Performance Is Good

In 1952 the maintenance grading outfit on the Eastern lines moved 141,562 cu. yd. of material at a cost of approximately 16 cents a yard. This unit cost includes the wages of the assistant roadmaster, the machine operators and laborers, and the cost of fuel, oil, and parts, but does not include depreciation, interest on the investment, taxes and other overhead items. The performance of this outfit in 1953 was almost the same as for 1952 although one machine was out of service for a while.

The railroad is pleased with the work and progress of these outfits. They were organized and work under the general direction of T. A. Blair, chief engineer system.



7. OPERATORS, responsible for maintaining their machines, inflated tires with air taken from air-brake systems of the Tournapull.

Traffic Decline—Reason for Gloom, or Opportunity?

The moderate but distinctly painful decline which has occurred in railroad traffic appears to have had considerably different effects on different railroad people. The effect on some of them has been to make them gloomy and apprehensive. Others, on the contrary, seem to have been stimulated to greater efforts to attack some of the basic difficulties which have been depriving the railroads in recent years of the ratio of the nation's total traffic for which railroad movement is economically best suited. An example of the second kind of reaction was given in a recent statement by President Wayne Johnston of the Illinois Central, whom we quoted briefly in our last week's issue. A still further example of this kind of response was afforded in the talk given by Lackawanna's President Perry Shoemaker to the Mid-West Shippers Advisory Board on January 21. Among other things, Mr. Shoemaker said:

"I believe that our determination to improve service will develop a railroad pattern of dependable movement which has never been approached. Improved service will be supported by a rate structure more nearly adapted to the economics of railroad transportation. In the not-distant future I believe the railroad industry will provide, on some basis, pick-up and delivery of carload freight.

"Each year since 1946, the railroad proportion of intercity freight ton-miles has steadily, even though slightly, declined. Our year-by-year increase in population, with its demands for service by private and public transportation, has witnessed the railroad industry, ratio-wise, losing traffic in serious volume to other forms of transportation. By recognizing and using the inherent capacity of the railroad plant and by reappraising our service, the opportunity is before us to reverse that trend."

Which attitude is in better accord with the facts—the one which sees traffic decline as a cause for apprehension, or the one which seizes upon it as a stimulus to improved service and traffic-building pricing?

It is this paper's conviction that the second attitude is the only one which conforms to reality. Regardless of the decline which has occurred in general business activity, there are too many glaring instances of traffic moving by agencies other

than rail — where the railroads have at least potential economic superiority — for anybody to contend that aggressive action by the railroads would not considerably improve their traffic position. It is true that regulatory obstacles could delay the railroads in using their economic advantages to claim all the traffic to which they are entitled. But, in the long run — and if the full facts are made generally known — who is there who is going to force the American people to pay a lot more for their transportation than there is any need of their paying?

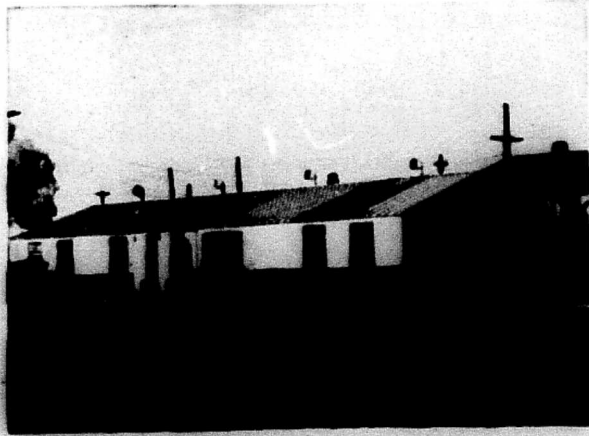
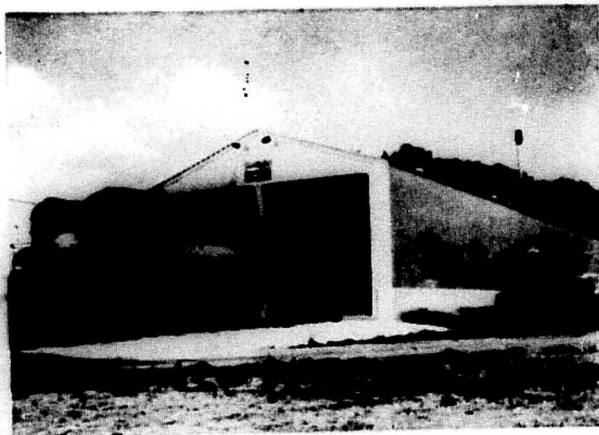
It is reasonable, therefore, to be fundamentally pessimistic about the outlook for the railroads only as regards the transportation jobs for which the railroads have lost their economic superiority, and from which they should withdraw.

Pessimism about anything else as far as the railroads are concerned is nothing more than the belief that human inertia and habit are a more powerful force than the human desire to get more by paying less. Previous experience of economic progress in this country strongly supports the conclusion that the American people are bright enough to embrace a bargain, whenever the fact that what they are being offered is actually a bargain is fully established. Prompt and dependable service — plus a price advantage in using rail service wherever the actual cost advantage also lies with the railroads — ought to put the railroads in a firm position to grow, once more, as the country grows. Any other belief than that is, in this paper's opinion, a pessimism which is unwarranted by experience.

Obstacles to Quality Service Are Gone

A fact inadequately realized by those who take a gloomy view of the railroads' future is that for more than a decade — and until quite recently — the railroads were getting more traffic to handle than they were equipped to handle as promptly as shippers required. First things have to come first, and it is difficult to be aggressively seeking more traffic from customers whose existing business isn't being handled to their satisfaction. The moderate decline in traffic has now, certainly, removed all obstacles which have heretofore existed to curtail the quality of railroad service. With quality of service now able to be fully restored, and with a plentiful margin of cost advantage to work from in their pricing for the bulk of the nation's transportation requirements, what basic reason can be found for gloom over the future of the railroads?

These Buildings and Motors



*have something
in common*



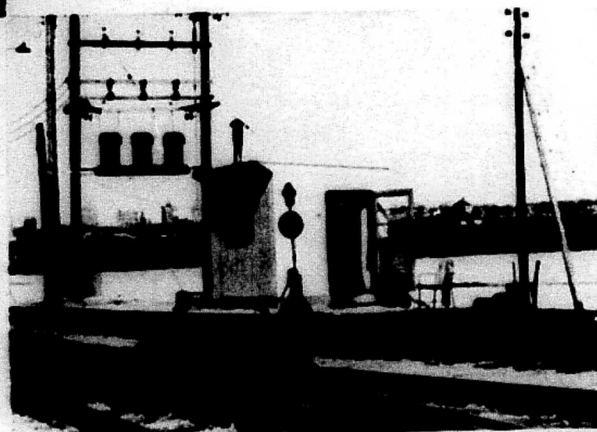
Think how simple it is to specify an electric motor to meet your specific needs. You can do the same thing

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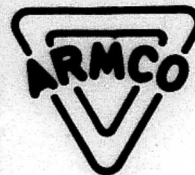
From a large warehouse or machine shop to a small utility building you select exactly what you need and you can specify one or a hundred with full assurance that they will be identical in construction, strength, durability and economy.

Armco Steel Buildings are available in a wide range of sizes with almost complete freedom in the placement of doors and windows. If desirable they can easily be rearranged, extended or moved to a new site. Sound engineering and precision manufacturing assure weather tightness, strength and durability. All-steel construction means utmost fire-resistance. Erection is easily and quickly done with your own crews.

Why not put these time- and money-saving advantages to work for you by specifying Armco Steel Buildings on that next job. Armco Drainage & Metal Products, Inc., 1083 Curtis Street, Middletown, Ohio.

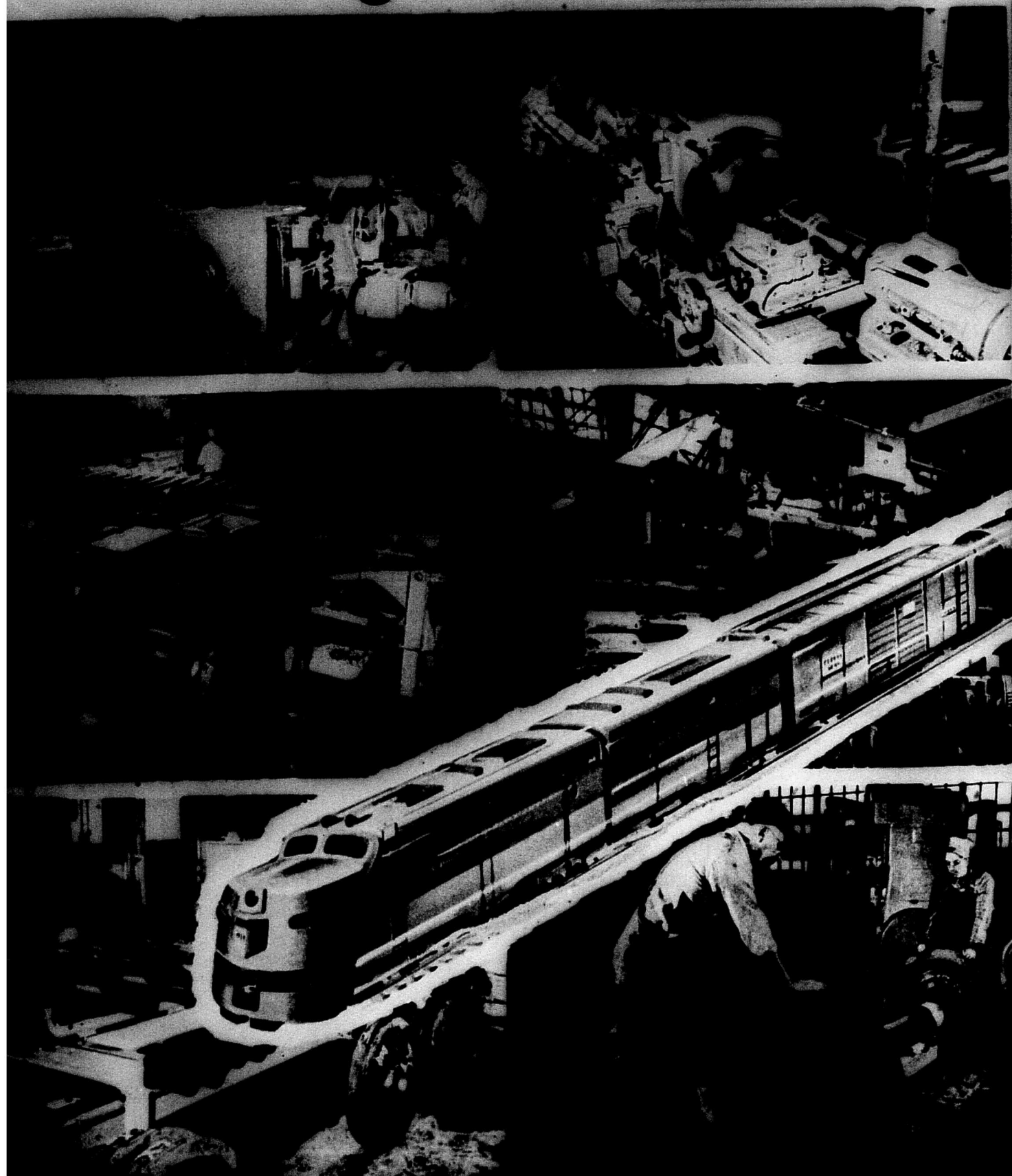


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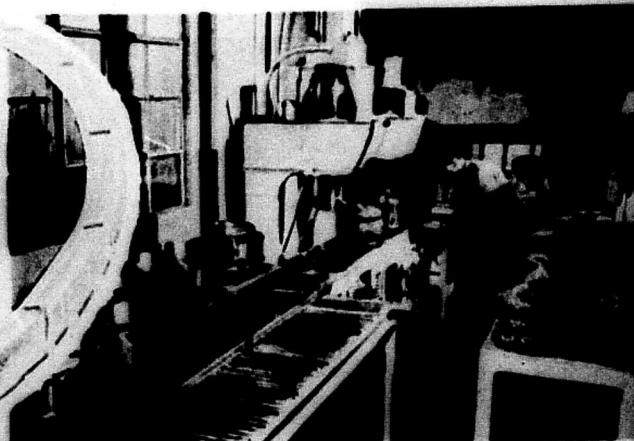
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The modern equipment shown here was installed to meet the current trend toward high revenue producing roller bearing freight trains.

With the development of assembly line techniques . . . specialized manufacturing equipment . . . engineering advances and in many other ways A.C.F. is able to turn out a better product in less time. Everyone benefits! Get the complete details before you buy. See your nearby A.C.F. Representative today. American Car and Foundry Company • New York • Chicago • St. Louis • Philadelphia • Washington • Cleveland • San Francisco

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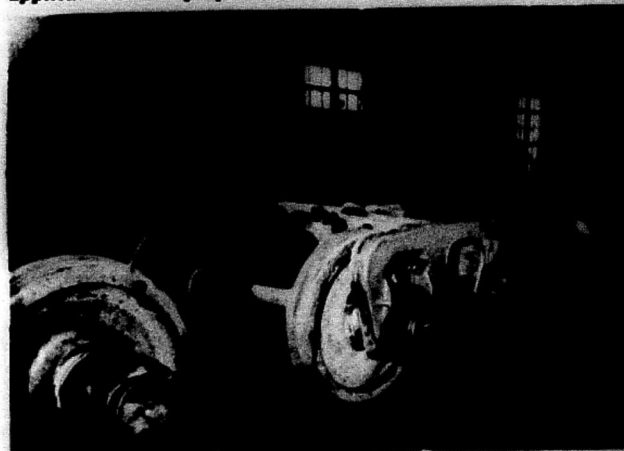
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Assembly of bearings in journal boxes is speeded by specially designed equipment.



Mounting of bearings on axle including the controlled application of the proper amount of grease.



Completed truck assembly; ACF assembly line technique permits unit production speed never before attained.

Questions and Answers FOR THE TRANSPORTATION DEPARTMENT

Many track scales are not regularly manned by a weighmaster, so occasionally train crews have to do weighing. What sort of training is given employees who are required to do this work?

Different systems are used.

(1) During periods when a weighmaster is not on duty at a track scale, cars are weighed by a properly qualified trainman, who has been instructed by the trainmaster or assistant trainmaster at appropriate intervals, so as to insure that the weighing is performed correctly.—*A. F. McIntyre, chief freight transportation, Pennsylvania.*

(2) I have made a thorough survey of our railroad, and find there are no points at which train crews are required to do weighing. At principal terminals the weighing is done by yardmasters and yard clerks, all sworn weighmasters under weighmaster's oath. At outlying terminals or other larger points where we have track

scales, this weighing is done by clerical weighmasters who have been "sworn in" and have taken the oath.

At some large industries, which have their own track scales, weighing is done by their employees, who usually are certified weighmasters. Weighing on the eastern district of our railroad is under supervision of the Western Weighing & Inspection Bureau, and on the western district is supervised by the Trans-Continental Freight Bureau's weighing and inspection department. These bureaus have inspectors who instruct weighmasters. Necessary rules and instructions are posted in all scale houses covering reporting of weights and care of track scales.—*A. W. Campbell, general superintendent transportation, Great Northern.*

A reader suggests that, because of high labor costs, some roads have greatly curtailed or perhaps entirely discontinued yard checks, leaving the finding of delays to cars a matter of chance. Do you regularly get a check of your principal yards for the purpose of locating delayed loaded or empty cars?

Yes. Yard checks are valuable.

(1) Our railroad is a very compact operation, with a large number of cars being moved short distances. Operating officers at a central location get daily reports from all yards, which reports include cars on hand. We have not discontinued our regular yard checks. In addition to the regular checks, there must be a follow-up to see that delayed cars are moved after they are located. With per diem at \$2.40 and the present competition for business, we feel yard checks are not only worthwhile but necessary.—*B. R. Gould, general manager, Union.*

(2) No reduction has been made on this road with respect to checks in principal yards for locating delayed loaded or empty cars. Our form 920, daily yard check, is prepared each weekday between 4 and 7 a.m. It shows all cars on hand at stations, whether loaded or empty, giving location track and date of arrival or other markings. Upon receipt of completed load check by yard checkers a designated supervisory clerk is detailed to examine same for delays and wrong markings.—*P. H. Fox, chief of transportation, Canadian National.*

Is it possible to operate diesel road-switcher units safely in multiple with regular diesel road units?

Yes. If road-switchers are properly equipped.

(1) It is possible to operate road-switchers safely in this manner. The road-switcher, of course, must be equipped for MU operation. If brake equipment on both road-switcher and road unit is 24 RL, the brakes will operate as on any other MU road diesel. However, if one unit has 6 DS brake equipment and is MU'd with a unit having 24 RL brake equipment, the trailing unit (whichever it happens to be) will have brakes operating as a car only. Brakes on the trailing unit will operate from an automatic application or release of the lead unit, but an independent application or release on the lead unit will not effect brake operation on the trailing unit.—*A. W. St. Clair, general manager, Southern, Charlotte, N. C.*

(2) With certain necessary changes in the system of air-brake piping on our road freight units so road-switcher brakes will respond properly to the brake valve on the leading freight diesels, we are successfully operating road-switcher diesels in multiple with regular road units in various combinations.—*R. J. Stone, vice-president operation, St. Louis-San Francisco.*

(3) Our road-switchers and box-cab type locomotives are not equipped to operate together in multiple units. On the Seaboard we have a booster unit, which is a conventional engine, which we couple up to regular road units and operate the locomotive in three or four units.—*C. I. Morton, superintendent, Seaboard Air Line, Raleigh, N. C.*

CONDUCTED BY G. C. RANDALL, district manager, Car Service Division (ret.), Association of American Railroads, this column runs in alternate weekly news issues of this paper, and is devoted to authoritative answers to questions on transportation department matters. Questions on subjects concerning other departments will not be considered, unless they have a direct bearing on transportation functions. Readers are invited to submit questions, and, when so inclined, letters agreeing or disagreeing with our answers. Communications should be addressed to Question and Answer Editor, Railway Age, 30 Church Street, New York 7.